

CLAIMS

1. Pneumatically driven loud speaker, **characterised in** that the loud speaker
5 comprises at least one first chamber (1, 62) having higher pressure than
the surroundings where the first chamber has at least one first opening (8,
61) to the surroundings, that the loud speaker in addition comprises at
least one second chamber (2, 64) with lower pressure than the
10 surroundings where this second chamber has at least one second opening
(9, 63) to the surroundings, and that the first and the second openings by
means of valve mechanisms (3, 65, 91, 92) alternately open and close at a
selected frequency.
2. Loud speaker according to claim 1, **characterised in** that the valve
15 mechanism (65) is comprised of a rotating body.
3. Loud speaker according to claim 2, **characterised in** that the valve
mechanism (65) consists of a duct (67, 68) which during the valve
mechanism's rotation periodically allows a flow of air from the first
20 chamber (62) to the surroundings and periodically allows a flow of air
from the surroundings to the second chamber (64).
4. Loud speaker according to claim 3, **characterised in** that the valve
mechanism comprises a part of a rotating body where the valve
25 mechanism's cross section transverse to its axis of rotation encompasses
at least one sector of a circle with sector angles preferably larger than the
diameter of the largest of the said openings.
5. Loud speaker according to claim 2, **characterised in** that the valve
30 mechanism is comprised of a rotating body in the form of a shell at the
periphery of the body or of several shell parts distributed over the
periphery of the rotating body.

6. Loud speaker according to claim 3, **characterised in** that the valve mechanism (65) consists of a duct (68) which runs straight through the valve mechanism.

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7. Loud speaker according to claim 1, **characterised in** that the valve mechanism (65) comprises a rocking body which rocks to and fro about an axis of rotation in a space (60) which contains the openings to the first and the second chamber and to the surroundings.

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8. Loud speaker according to claim 7, **characterised in** that the rocking body in one end position closes the opening to the first chamber and in the other end position wholly or partly closes the opening to the second chamber.

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9. Loud speaker according to claim 8, **characterised in** that the rocking body consists of a spherical segment of a sphere or of a segment of a circular cylinder.

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10. Loud speaker according to claim 2, **characterised in** that the valve mechanism (65) can be slid in the direction of its axis of rotation, whereby the areas of the said openings change, which changes the character of the sound generated by the loud speaker.

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11. Loud speaker according to claim 7, **characterised in** that the valve mechanism (65) can be slid in the direction of its axis of rotation, whereby the areas of the said openings change, which changes the character of the sound generated by the loud speaker.

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12. Loud speaker according to claim 1, **characterised in** that the valve mechanism (3) consists of a tube, with an opening to the surroundings, which by means of a drive mechanism is able to slide through the walls of

the chambers and that on the tube's envelope surface the said tube contains openings (4) positioned so that the tube openings are moved between the chambers (1, 2) when the tube is moved.

- 5 13. Loud speaker according to claim 12, **characterised in** that at least four chambers (1, 2) with alternating positive and negative pressure are stacked one above the other in a sandwich-like construction.
- 10 14. Loud speaker according to claim 12, **characterised in** that the tube (3) has a number of sets of openings on the envelope surface (4), such that this number corresponds to the number of chambers (1,2) with positive and negative pressure.
- 15 15. Loud speaker according to claim 12, **characterised in** that it comprises several tubes (3) spread over a surface.
- 20 16. Loud speaker according to claim 12, **characterised in** that the drive mechanism for sliding the tube (3) is an electromagnetic drive unit containing a coil.
- 25 17. Loud speaker according to claim 12, **characterised in** that the drive mechanism for sliding the tube (3) is a piezo-electric drive unit.
18. Loud speaker according to ^{claim 1} ~~any of the above claims~~, **characterised in** that a drive unit for mechanically moving the valve mechanism (3, 65, 91, 92) is controlled by a control unit which by signal processing translates an input signal to an equivalent electrical control signal to obtain an output signal, corresponding to the input signal, for the loud speaker.
- 30 19. Loud speaker according to claim 18, **characterised in** that the control unit comprises a artificial neuron net.

20. Loud speaker according to claim 18 ~~or 19~~, characterised in that the control unit is connected to the gauge for detecting the loud speaker's output signal for feedback control.

5 21. Application of a loud speaker according to claim 1 for active noise suppression.

22. Application according to claim 21 in active noise suppression in jet engines, and especially turbo-fan engines.

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23. Application according to claim 21 in active noise suppression in ventilation systems.

15 24. Application according to claim 21 in active noise suppression in gas turbine outlets.

25. Application according to claim 21 in active noise suppression in exhaust systems of combustion engines.

20 26. Application according to claim 21 in sound reproduction in hi-fi applications, such as at concerts, in cinemas and in homes.

27. Application according to claim 21 in sound reproduction in head phones, telephones, ear phones and the like.